COMPETITIVE CONTROVERSIES
IN RESOURCE MANAGEMENT:
AN EVALUATION OF CONFLCT
OVER THE USE OF MARINE
RESOURCES

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COMPETITIVE CONTROVERSIES IN RESOURCE MANAGEMENT: An Evaluation of Conflict over the Use of Marine Resources

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PREFACE

From 1982 to 1986, the Bureau of Fisheries and the Coastal Area Management Program of the Department of Environmental Protection have cooperated in the development of fisheries management planning documents intended to identify major problems and issues facing marine resource managers.

In 1984, the Department published **"A MARINE RESOURCES MANAGEMENT PLAN FOR THE STATE OF CONNECTICUT"** which described the resources and fisheries of the State, identified problems, issues and opportunities facing managers and users of those resources, and suggested policies and objectives for effectively managing them.

"COMPETITIVE CONTROVERSIES IN RESOURCE MANAGEMENT: An Evaluation of Conflict over the Use of Marine Resources" represents a further, more detailed evaluation of one of the principle issues -- User Group Conflict -- raised in the Plan. The report is analytical, and somewhat subjective. It represents our impression of the subject at this time, supported by insights offered by resource managers in other areas.

The subject is volatile and dynamic. Before too many months have passed, it will be outdated, consequently, it must be considered our "snapshot representation" of the subject of user group conflict as we perceive it in the northeastern U. S. in 1986.

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EXECUTIVE SUMMARY

User group conflicts are defined as those incidents in which a group of resource users, organized in some fashion, opposes the activities of another group. In the context of this paper, we will consider only those conflicts associated with marine fishery resources.

Such conflicts occur almost exclusively for resources or for the space required to fish for those resources. They are motivated by a fear that different fisheries are mutually exclusive, that is, the conduct of fishermen in one will preclude opportunities of fishermen in the other.

Competition is frequently at the heart of controversies which initially appear to be based on conservation. This observation has proven to be a "common denominator" in conflicts over marine resource use in all coastal areas. It is a consequence of too many people wanting too much of a resource. The people, eventually organized in groups with similar philosophies on resource use, compete in attempting to obtain what they perceive as their "fair share of the catch."

User group conflicts are an inevitable consequence of increased competition for a limited resource. The only way to eliminate such conflict is to increase the resource available or reduce the number of competitors. Since the former is largely beyond our control, the latter may very well be the only option available -- <u>if one truly wishes to eliminate conflict</u>.

Proposals to reduce the number of fishermen in a fishery will never be popular and, in most cases, are not justified. However, the present alternative to reducing the number of participants (at least in a commercial fishery) seems to be to "starve them out" by distributing a fully-exploited resource among an ever-increasing number of resource users. This is also a harsh remedy and it, too, may not be justified. A more reasonable goal may be simply to <u>reduce</u> conflict as much as possible, given the constraints placed on managers by the availability of a properly-managed, properly-conserved resource and by the number of users wishing to use that resource. It is this goal -- reduction of conflict without eliminating competitors -- which is the subject of this report.

Central to the resolution of any user group conflict is the absolute requirement that opponents communicate with one another at the earliest possible point in the controversy. To a lesser degree, but also important, the greater the number of participants who ultimately agree to the settlement, the more successful will be the outcome of the controversy.

Passive methods of resolving user group conflicts include discussion, negotiation, mediation, facilitation, and ultimately, compromise. More argumentative methods of addressing conflicts include confrontation, competitive lobbying, and ultimately, either grudging reconciliation or permanent alienation. Solutions to conflicts may be accomplished by mutual agreement, regulation, legislation, or court order.

In this paper, we explore examples of the diversity of user group conflicts in order to determine whether a "common thread" exists that will be most successful in achieving solutions to such conflicts. We have explored the available "literature" which includes the results of symposia on the subject but is best summarized in the news media coverage of such events. Atlantic and Pacific coatal state fishery management agencies, the New England, Mid-Atlantic, South Atlantic and Gulf of Mexico Fishery Management Councils, and the Gulf States Marine Fisheries Commission were surveyed to discern the types of conflicts which have arisen nationwide and the methods of resolution employed. Finally, we have summarized the successes and failures of an ongoing user group conflict between commercial fishermen in Long Island Sound, as one example of the nature of such a controversy and the considerations which influenced its resolution.

Our intent is to providee a greater understanding of the motivations which result in such conflicts and, hopefully, some measure of assistance in developing ways to resolve them.

We do so because we believe all marine fishery uses are valuable or important to someone in this nation and, regardless of one's personal viewpoint, all deserve to be considered in what will only become greater and more numerous conflicts for resources and fishing space in future years.

COMMON ELEMENTS IN COMPETITIVE CONTROVERSIES

The following points are offered to suggest what we see as the key elements of competitive controversies. In addition, we suggest some management options which appear to have been useful in Connecticut and other areas in the resolution of user controversies. They have been distilled from responses to a survey of resource managers from Atlantic, Pacific and Gulf Coast States, Regional Fishery Management Councils, and Interstate Fishery Commissions.

* **THE FEAR OF BEING EXCLUDED:** Concern that an individual will be excluded from some present use of a resource seems to be a common motivation of those involved in such controversies. Since marine resources are considered "common property," rights prior to capture are not guaranteed and the fear that a competitor will "beat you to the catch" becomes an over-riding influence in the controversy.

* **CONFUSION BETWEEN MOTIVES OF CONSERVATION AND COMPETITION:** In use controversies, a user group often claims to be motivated by a concern for the resource (i.e. conservation) -- and then attempts to restrain or eliminate use of the resource by the other group. The real motivation in such controversies is generally competition.

* **THE PROBLEM OF CONFRONTATIONS:** There is a need for discussion early in the development of any use conflict. The conflict must not be allowed to reach "crisis proportions" before resolution is attempted. Inevitably, competing parties and negotiators have to discuss the conflict, and hostility retained from an earlier confrontation simply obstructs attempts at reconciliation.

OPTIONS FOR RESOLUTION OF USER CONFLICTS

* **SEPARATE THE COMPETITORS:** Explore the use of gear separation areas in resolving gear conflicts -- they seem to have worked in a number of areas.

* **REGULATE THE NUMBER OF EXPLOITERS:** Explore methods of reducing the number of competing users. This will not necessarily eliminate existing conflicts but a reduction in the number of participants, vessels, or gear types may reduce the potential for future conflicts.

* **REGULATE THE EFFICIENCY OF EXPLOITERS:** Explore the regulation of efficiency in conflicts over the magnitude of catches made by users of different gear types -- while such strategies restrain the more efficient operator, often they allow a fishery to occur which might otherwise be excluded.

* **ALLOCATE THE RESOURCE:** Explore the assignment of fishing rights to marine resources (e.g. designation of property rights, quotas, etc.) either to individuals or to user groups. Such allocation strategies often appear to be panaceas in use controversies but they have considerable disadvantages as well. They pose an interesting set of problems which make sense in theory but have a number of problems in application. If they are to be considered, it is recommended that the experiences of other states and nations in this regard be carefully explored.

INTRODUCTION

Conflicts over the utilization of marine fishery resources in the United States have become extremely emotional and divisive during the last decade. The conflicts, and the controversies from which they arise, have a lot to do with competition, and with greed. The latter emotion is not only related to money but also to the desire of users to obtain a greater share of the resource -- at the expense of their competitors.

With continual new developments in vessel technology, fishing gear and electronic equipment, commercial and recreational fishermen are becoming more efficient exploiters of fishery resources. Prior to the enactment of the Fishery Conservation and Management Act of 1976 (the Magnuson Act), U.S. commercial fishing fleets, in many instances, did not have the capacity to fully exploit marine fish stocks. Now, with a greater number of vessels and significant advances in catcher technology, overexploitation of many important stocks is a problem. The resource has become limited and competition has become intense. Controversies over use abound and the conflicts they inspire are becoming more frequent. The resource manager is faced with balancing the life-sustaining requirements of the resource with the desires of competing users.

User group conflicts occur among fishermen exploiting the same resource with the same gear, between fishermen using different gear types to exploit the same stock, and between fishermen using different gear for different stocks but in the same space (Christy 1982). Conflict also occurs among competing users of the marine environment, such as those who take fish and shellfish for food and recreation, and those industries and activities which contribute to environmental degradation (e.g. ocean waste disposal, some forms of mineral resource exploration). Furthermore, competition for space in the marine environment is a growing problem (e.g. shipping traffic and recreational boating vs. fixed gear). Loss of income, decreased efficiency of gear, loss of gear and associated catch, vessel collision, loss of fishing time, and pre-emption of fishing grounds are just some of the problems associated with user group conflict. These problems result in economic losses, increased hostility among user groups, and occasional violent confrontations.

While many of the examples just cited are beyond the scope of a paper dealing with controversies over the use of living marine resources (i.e. fishery resource conflicts), they do indicate the complexities of present use controversies as well as the nature of those which face us in the future, since they will likely only worsen over time.

This report will deal specifically with controversies over the use of fishery resources. Such controversies are varied but all result from two causes: allocation issues and competition for fishing space. Frequently, conservation appears to be the principal issue; ultimately, economics and one's opportunity to fish are more significant motivating factors.

Given the diversity and unpredictability of factors contributing to conflicts over the use of living marine resources, reducing tensions among user groups while ensuring a fair and equitable distribution of a limited "common property" resource is one of the major issues confronting marine resource managers.

It is our intent within this report to evaluate factors which contribute to conflicts over the use of living marine resources and options available to resource managers and to competitors for resources in resolving, mitigating, and avoiding such conflicts.

Our objective is to reduce the subject of competitive controversies to a form which will be helpful to others in achieving the most effective resolution possible to these types of conflicts. For those involved in conflict resolution, some of what follows will seem to be a "statement of the obvious." On the other hand, the condensation of examples of diverse controversies may provide some "common denominators" which will be useful in resolution of future conflicts. In this instance, we hope even resource managers experienced with such disputes will gain something useful from our efforts.

2.0 AN EXAMPLE OF CONFLICT: Trawling for Lobsters in Connecticut

Resolution of user group conflicts in Long Island Sound is perhaps the most frustrating problem facing Connecticut's marine resource managers in the 1980's. The history of the most recent conflict in Connecticut demonstrates the complexity of the issues involved and the difficulty in achieving a satisfactory resolution to these conflicts.

Due to high market value and a consequent high level of commercial exploitation, the American lobster is often the subject of controversy. While lobster pot fishermen in Connecticut have always maintained that trawlers damage or cause the loss of their pots, conflicts between these groups intensified in 1982 when a directed, successful, and highly visible trawl fishery for lobsters developed in western Long Island Sound.

A great controversy arose over this fishery with pot fishermen alleging that lobsters and their habitat would be damaged by trawl gear, and the resource quickly depleted. Common statements referred to widespread mutilation and mortality of lobsters taken by trawls. Underlying fears appeared to be that the introduction of trawling for lobsters would upset "the market," redistribute earnings, and eliminate some of the income of pot fishermen. Trawl fishermen contended that pot fishermen, by the pre-emptive nature of their gear, were not allowing trawlers equal access to a resource to which they were also entitled. At the same time that the lobster controversy developed, sport fishermen in western Connecticut raised concerns that large trawlers were fishing too close to shore and over-exploiting finfish resources. Seeking relief from trawlers, lobster pot fishermen and western Connecticut sport fishermen appealed to the Department and to the Connecticut General Assembly to resolve the controversy.

The General Assembly enacted temporary legislation in 1983 restricting trawlers operating in the Connecticut waters of western Long Island Sound to a daily limit of 100 lobsters. Companion legislation called for investigations into lobster management in Connecticut and the effect of trawling on lobsters and lobster habitat. The study was conducted by the DEP and the University of Connecticut and the results were made available during the 1985 legislative session to support more permanent decisions regarding the protection and use of the lobster resource in Long Island Sound.

The results indicated that taking lobsters by trawl should be restricted during molting periods, that is, those times in which lobsters are in soft shell condition and vulnerable to physical injury (June-July and October-November in Long Island Sound). Trawling was judged to be no more harmful to the resource than potting during "intermolt" (hardshell) periods, with damage to trawl-caught lobsters less than 3% and mortality 1% or less.

DEP recommended that the 100 lobster limit apply throughout Connecticut waters during the summer and fall (June 1 - December 31) and that a 500 lobster limit be imposed during the winter and spring (January 1 - May 31). It was the intent of these recommendations to protect lobsters from trawl-related damage and mortality during vulnerable periods but to permit trawlers to direct their effort toward lobsters during times that no justification of a conservation nature existed to support a restriction. The upper limit of 500 lobsters was recommended for socio-economic reasons, that is, to deter further transition within the "fleet" to trawling and to discourage relocation of non-resident trawl vessels to Connecticut. In response to public hearing comments, the level of the winter limit was later reduced to 300 to accommodate the concerns of Connecticut pot fishermen that their livelihood would be jeopardized by the higher limit. Under these measures, DEP was confidant that little or no additional directed trawling for lobsters would occur.

The results of the investigation and the recommendations which followed were denounced by western Connecticut pot lobstermen who contended that DEP was catering to a minority of the users instead of concerning itself with protecting the resource. Significantly, much of the rhetoric was addressed towards maintaining the "status quo" of the past two years, that is, the 100 lobster limit in western Long Island Sound, even though by legislative action, the limit had been intended only as a temporary measure until facts could be generated to resolve the controversy permanently. At this point, the controversy became highly politicized. The Regulations Review Committee of the General Assembly subsequently altered the regulations and restricted trawlers operating in most of the Connecticut waters of Long Island Sound to a year-round limit of 100 lobsters per day.

The controversy began with a legitimate concern for the future of the resource. However, it degenerated to a highly politicized confrontation between western Connecticut potters and central Connecticut trawlers, each with their legislative supporters. The controversy was aggravated by the arrest of two prominent trawler operators for violation of the 100 lobster limit. The controversy at this point had little to do with conservation -- it was an issue of economic competition, based on gear conflict, and the income to be made from lobsters. During the 1986 legislative session, the Connecticut House of Representatives overwhelmingly rejected a bill which would have restored the 300 lobster winter limit for trawlers. Essentially, the legislature took a conservative approach to the controversy and resolved an emotional, socio-political issue by allocating the directed lobster fishery to potters and limiting trawlers to a 100 lobster daily limit.

3.0 MANAGEMENT TECHNIQUES USED TO RESOLVE USER GROUP CONFLICTS

As pressure on marine fishery resources increases, special arrangements or rules are needed to accommodate the growing and conflicting demands of user groups and allow them to operate together efficiently and with a minimum number of conflicts. There are a variety of management alternatives available to resource managers and user groups confronted with a conflict. Some management measures, such as gear marking requirements and reporting of fixed gear, are intended to reduce the risk of conflict and do not involve explicit allocation of fishing rights. However, because conflicts frequently arise from competition for a limited resource, resolution of these conflicts most often involves decisions regarding the distribution of benefits between user groups -- such as rights to a particular species or rights to set gear in a particular area.

The choice of management schemes is dependent on a thorough evaluation of the practices of user groups involved in the conflict, and the factors leading to the conflict, including: the direction of the conflict (i.e which use imposes costs on another use); the number of user groups involved in the conflict; the geographic location of the conflict and extent of impacts; the number and frequency of conflicts; and the conditions under which the conflicts occur (Miles et al 1984). In addition, an accurate assessment of the political and social factors motivating the conflict is essential. This information should be obtained through careful consultation with user groups.

Because the success of a management measure is often dependent on how well it is enforced, enforcement capabilities, and the "enforcability" of proposed measures should also be considered when exploring management options. Finally, the distributional implications of proposed management measures should be thoroughly evaluated and once in place, regulations should be continually monitored for their effectiveness, pertinence and impact on affected user groups.

Some of the management options considered or attempted by coastal fishery management agencies include: marking and setting requirements for fixed gear, gear separation schemes, gear restrictions, and time of day restrictions. Our experiences with these methods, as well as management options implemented or considered for resolution of user group conflicts in other areas will be discussed.

3.1 Conflicts Over Resource Utilization

Conflicts over resource utilization occur when there is open competition among fishermen for the same species -- each user wishing to maximize their share of the catch or opportunity to fish. Because of this, conflicts most often center on a heavily exploited and highly valued species.

Marine recreational fishing, including fishing from shore, private boats, and party or charter boats, is of increasing economic significance and consequence to resource managers. Coincident with the increasing participation in marine angling is an increase in the the number and potential for conflicts between recreational anglers and other marine resource users, in particular, commercial fishermen competing for the same stocks at the same time of year. Controversies also exist over the incidental commercial harvest (or "bycatch") of prey species or juvenile fish of importance to recreational fishermen. As competition between commercial and recreational fishermen for limited resources intensifies, one can expect the number of conflicts between these groups to increase.

Allocation conflicts also occur among commercial fishermen employing either the same or different gear types to exploit the same resource. The motivating factor behind such conflicts again is competition - in this case for income.

Management measures designed to resolve conflicts over utilization of a particular species include: direct allocation through catch quotas or assignment of a species to a particular user group (such as designating a particular species a game fish); or indirect controls on the distribution of catch through gear and effort limitations (i.e. gear restrictions, area/season closures).

3.1.1 Catch Restrictions or Allocations

When competition for the same stock causes conflicts between commercial and recreational fishermen, resource managers often directly regulate the quantity and distribution of catch by establishing catch quotas for competing user groups. Such allocation schemes are complicated by a lack of accurate and current catch statistics and by the fact that anglers sometimes sell their catch. Reliable and current information the status of the stock, and total catch by species, area and gear type for all user groups is essential if fair and equitable allocation decisions are to be established and enforced.

* In Oregon and Washington, where there have been severe conflicts between recreational and commercial harvesters of salmon, the two user groups have agreed to a sliding scale strategy. During periods of low abundance, the sport fisheries take a greater percentage, and with high abundance, a larger percentage

goes to the commercial fleet. This arrangement, which has been successful in resolving much of the conflict, is viewed as a sensible, albeit not perfect, allocation framework agreed to by both the recreational and commercial industries (Crutchfield 1984).

* Because it is a preferred species of both sport and commercial fishermen, there has been significant controversy among user groups in the Florida king mackerel fishery. The recent development of highly efficient roller rig gill nets (sec.3.1.3) has also led to conflict between different components of the commercial fishery (hook and line vs gill net fishermen). Specific allocation of catch was the principal management technique used to resolve these conflicts and to prevent overfishing. In order to reduce the catch of various user groups equitably, allocations were based on the historical catch ratios of recreational and commercial fishermen. Following calculation of this ratio, allocations were adjusted to compensate for the sale of "recreational" catch (South Atlantic and Gulf of Mexico Fishery Management Council 1985).

Unfortunately, allocation disputes are not always settled so equitably. When conflicts develop between commercial and recreational fishermen competing for the same stock, "solutions" to these conflicts are often determined by the relative political power of the two groups. Due to the well-organized efforts of recreational fishing interests, there are numerous examples in which allocation disputes have resulted in a disproportionate share being allocated to recreational fishermen; in some cases, finfish species have been designated exclusively to recreational anglers. The type of legislation which allocates public resources to sport fishing interests at the expense of commercial operations (and implicitly, the non-fishing seafood consumer) may be setting a precedent which eventually precludes those in the largest marine resource user group -- consumers -- from their opportunity to share that resource.

* Allocation of catch is sometimes used to protect a small or "traditional" fishery from highly efficient gear competing for the same stock. In response to conflicts between competing commercial gear types in the Alaskan sablefish fishery, the North Pacific Fishery Management Council divided the optimum yield for sablefish between longliners, trawlers and pot boats, with pot boats to be phased out of the fishery completely in 1989. The final split will allocate 80 percent of the catch to longlines and the remainder to trawl fishermen. This action was taken to resolve spatial conflicts between pot boats and longliners and to prevent trawl gear from monopolizing the fishery, as it could have without Council intervention.

3.1.2 Area/Season Closures

Spatial and temporal restrictions on fishing have traditionally been used to regulate fishing mortality, and protect stocks from exploitation during vulnerable life history stages. There is an increasing trend however, to impose area/season restrictions to resolve conflicts between users of different gear types competing for the same fishing grounds or species. Because of their use for conservation purposes, there is significant historical precedent for area/seasonal restrictions as management tools for marine fisheries and they are often widely supported by the fishing industry. In addition, spatial and temporal restrictions on fishing are relatively easily administered and enforced (Sissenwine 1982).

* Closures are sometimes instituted in nearshore areas to protect small, inshore fisheries (primarily recreational) from what is perceived to be unfair competition by larger, more mobile fishing operations competing for the same resource.

Due to concerns about the effects of trawling for fish on the opportunities of sport fishermen in western Long Island Sound, two such regulations were implemented in Connecticut in July, 1983. The first prohibits the new use of trawl vessels greater than 44 ft. in length from operating in the Connecticut waters of western Long Island Sound. Fishermen with a prior history of using a vessel larger than this size to trawl in the Sound remain entitled to do so. The second regulation prohibits trawlers greater than 26 ft. in length from operating north of a line paralleling the coast one-half to two miles from shore in western Long Island Sound. This measure was implemented as much for conservation purposes as it was intended to resolve user group controversy. Although this mandatory gear separation scheme has been successful in eliminating much of the conflict, trawlers have suffered the full burden of the solution.

* Conflicts in the 1970's between purse seine operators and recreational fishermen in Long Island Sound have been resolved through agreed upon, statutory acts which prohibit the use of purse seines in nearshore areas. Initially, recreational fishermen concerned that seiners were taking game fish in menhaden nets were successful in obtaining legislation which banned the use of purse seines inshore of a line lying two miles from Connecticut shores. However, the seiners took the matter to court and the judge ordered the user groups to resolve their differences outside the courtroom. Subsequently, representatives from both groups agreed on a line, closer to shore and inshore of which seiners would not fish. This compromise line of separation which prohibits seining in productive sport fishing areas has been very successful in resolving the conflict, due in part to continuing communications between representatives of the groups.

* To resolve conflicts between competing gear types in Virginia's oyster fishery, legislation was enacted to separate

hand and patent tong users through area/season restrictions on both gear types. This gear separation scheme has been successful in alleviating much of the conflict, however there has been recent interest in redefining present gear separation zones. An oyster fishery management plan being developed by the Virginia Marine Resources Commission is considering transferring legislative control of the fishery to regulatory control to allow for a more flexible management process to resolve these conflicts.

* Because of conflicts in California between commercial gill net fishermen and commercial passenger fishing vessels (CPFV's) competing for valuable species, legislation was enacted which banned the use of gill nets in areas of significant importance to CPFV's. In addition, limits were placed on gill net length, and a moratorium established on gill net permits. The CPFV fishery has since expanded out of protected areas and vessel operators are now calling for further restrictions on the gill net fishery.

* By legislation, season/area closures were implemented in California to alleviate the incidental catch of marine mammals by gill net fishermen. These management techniques, which have been moderately successful in resolving conflicts between commercial gill netters and marine mammal interests, were the result of negotiation and compromise between user groups, with the Department of Fish and Game acting as mediator.

* Bans on gill nets have been established for designated bays and harbors ("Fisheries Management Areas") in Hawaii to eliminate conflicts between sport anglers and gill netters competing for seasonal runs of bigeye scad. These areas have been successful in resolving the conflict because they have permanently prohibited the competing gear type.

3.1.3 Gear Restrictions

The introduction of innovative, highly efficient, or non-traditional methods of fishing can often lead to conflicts with fishermen using traditional gear or fishing methods. Fisheries managers are often forced to regulate the type and amount of fishing gear used to prevent destruction of a resource, however often the goal of the gear restrictions is not to protect the resource from "destructive" gear, but to protect the position in the fishery of another less efficient gear for political or social reasons. Gear restrictions to fulfill either objective, have extreme distributional implications (Panaytotou 1982).

* Many times, gear restrictions result from political pressure exerted on resource managers and legislators by recreational fishermen. Recreational fishermen in the Gulf of Mexico have been successful in obtaining regulations designed to reduce the efficiency of commercial gill nets used to catch spotted seatrout and are lobbying to have the use of gill nets banned in the king

mackerel fishery. In the Florida reef fish fishery, the recreational groups are attempting to have fish traps banned, claiming that traps overfish and that coral reefs are damaged by setting and retrieving the traps. Whether or not their arguments have merit, these factions are placing an impressive amount of political pressure upon fishery managers (Nakamura 1980).

* The development of the hydraulic net hauler or "roller rig" is an example of a clash between old and new technology which has caused conflicts along the east coast. While large roller rig vessels rely on the same type of nets that "conventional" gill netters use, the development of the hydraulic net hauler has enabled vessels to handle much larger nets which can effectively be fished in deeper water. The technique used by many "roller rig" fishermen involves the encirclement of a school of fish, located by a spotter plan working with the vessel.

In the spring of 1982, four Florida-based roller rig gill netters were brought to the Chesapeake Bay to fill an export quota of bluefish for a Virginia seafood company. Because bluefish are highly valued by Chesapeake Bay sport fishermen, opposition to this highly efficient gear type was quickly voiced. Claiming that bluefish stocks would be severely depleted, sport fishermen immediately appealed to the Virginia Marine Resources Commission for restrictions on roller rig gill nets. A regulation was subsequently passed which limits gill net depth, and requires that they be deployed in a straight line, and fished not less than 200 feet from another gill net. So far, this example of "regulated gear inefficiency," which prevents the use of encirclement gill nets while still allowing "traditional" gill netting, has been successful in eliminating the conflict. In Connecticut, a similar regulation was implemented in anticipation of lobster pot vessels converting to roller rig gill nets for bluefish. Effectively, the regulation prohibited a new fishery before anyone attempted to enter it.

* There are numerous instances of regulations aimed at decreasing gear efficiency to promote conservation and to resolve conflicts between fishers of "traditional" gears competing for a limited resource with users of more efficient gear. For example, if the use of highly efficient large dredges and hydraulic haulers was permitted on seed oyster beds in Connecticut, those using this gear would be able to monopolize the fishery. However, because only hand power may be used to haul dredges on natural growth seed oyster beds, potential conflicts are avoided between the "natural growth" harvesters and private shellfish companies. The law prohibiting this gear ensures the perpetuation of a traditional, small scale fishery in which a number of individuals can enter and participate.

* Due to conflicts between tongers and users of hydraulic dredges, legislation was passed in Virginia prohibiting the use of hydraulic gear for hard clam and oyster harvesting. The use of an escalator dredge on leased ground is currently being investigated in the oyster fishery.

3.1.4 Gear Modifications or Innovations

The incidental capture (or "bycatch") and destruction of non-target species or undersized fish is often the subject of use controversies. While most often implemented for conservation purposes, innovations designed to improve gear selectivity and reduce bycatch are possible long term solutions to use conflicts which might otherwise be resolved only by the use of allocations.

Currently, gear technologists are concentrating on the development of gear that selectively harvests a certain species or size group, thereby reducing the incidence of bycatch and discard mortality. Lobster trap escape vents, square-mesh cod ends in bottom trawl nets, and shrimp separator trawls (also known as Turtle Excluding Devices, or TEDs) are examples of such gear modifications. In addition to eliminating a source of conflict, such innovations promote efficiency and conservation.

3.2 Conflicts Over Space

Conflicts over space occur when one use of the marine environment preempts or physically interferes with the activities of another user group wishing to fish in the same area. Gear conflicts have always occurred between users of commercial gear types fishing in the same area, in particular fixed and mobile gear. Decreased efficiency of gear, loss of gear and associated catch, vessel collision, preemption of fishing grounds and hostility among user groups are some of the problems associated with this type of conflict. Loss of pot gear also has serious resource implications since lost or so-called "ghost pots" continue to trap lobsters until they degrade sufficiently to allow escapement.

Competition for space also occurs among fixed gear fishermen using the same or different types of fixed gear. This type of conflict involves the "territorial" nature of fixed gear fishermen and the preemption of desirable fishing grounds and is compounded by gear saturation and heightened competition for limited, productive fishing areas.

In a broader sense, there is growing competition for space between fishermen and non-fishery uses of the marine environment. Fixed gear losses arise from physical conflict with various types of commercial and recreational boating traffic unrelated to fishing. In addition, coastal activities which preempt productive fishing grounds (e.g. pipelines, dump sites) are clearly in conflict with the interests of both sport and commercial fishermen.

Some management measures that will be discussed are intended to reduce the risk of conflict between incompatible gear types or user groups operating in the same area and do not involve allocation of marine habitat. Others are designed to spatially separate competing user groups through the use of time and area restrictions, and involve decisions regarding the distribution of benefits between user groups.

3.2.1 Fixed Gear Marking and Setting Requirements

Although all fixed gear fishermen must mark their gear in some manner to be able to identify and retrieve it, gear markings are often poor and inconsistent and are a major cause of the conflicts involving fixed gear. Gear marking and setting requirements are intended to improve the visibility of fixed gear, thereby reducing the number of conflicts. In addition, improved marking of fixed gear may allow other users to fish in closer proximity, therefore lessening it's preemptive nature. The resulting decrease in the number of lost gear units which continue to capture and kill will have conservation benefits as well.

While standardization of fixed gear marking and setting requirements may initially seem desirable, preferred options may vary significantly with local traditions and geographic conditions. Care must be taken not to impose mandatory regulations which negate successful arrangements already worked out by local fishermen. Again, the choice of management measures should be established through consultation with industry representatives.

* One of the most significant causes of gear conflict between lobster pot fishermen and trawlers in Long Island Sound is the often poor visibility and irregular patterns in which lobster pots are set. During certain weather and tide conditions, pot buoys are not visible even during daylight hours. In some areas, strings ("trawls") of pots are not set in a uniform direction and are so long that it is difficult to see both ends. Consequently, mobile gear fishermen are often unable to locate the direction of set or determine end buoys, making unobstructed passage between strings impossible.

In 1985, in an effort to alleviate gear conflicts between mobile and fixed gear, the DEP proposed standard fixed gear marking and setting patterns. Specifically, the proposed regulations called for a minimum buoy size and a standardized color pattern for marking ends of pot strings (solid color buoys for marking the south or west ends and a buoy of not less than two colors to mark the east or north ends of the set). The regulation also proposed a maximum length of five hundred feet for any string of pots sharing a common ground line.

These proposed regulations were later withdrawn in response to public hearing comments which suggested that the proposed measures would not have the desired effect (i.e. to reduce the incidence of gear conflicts). Pot fishermen generally felt that the proposed buoy strategy was too confusing, and several suggested that the buoy size proposed (7 inches in diameter and not less than fourteen inches in length) would cause the pots to float or drift. The regulation pertaining to a maximum groundline length was rejected on the grounds that it would exacerbate conflicts by increasing the number of buoys in Long Island Sound. Since many of the concerns voiced were not entirely defensible, the subject of gear marking and setting standards remains an option for resolution of this type of controversy.

* Amendment #1 to the American Lobster FMP is the first to establish uniform marking and setting requirements for a fixed gear fishery in the FCZ. The chief objective of the amendment is to implement uniform gear marking requirements for the offshore lobster fishery to "reduce gear conflicts and to contribute to the orderly prosecution of the lobster fisheries and mobile gear fisheries in the offshore waters of New England and the Mid-Atlantic." Gear marking requirements call for both a tetrahedral corner radar reflector (a metallic device which reflects radar radio waves) of not less than 8 inches and a flag on the westernmost end of a string of lobster pots and a radar reflector on the easternmost end of the string. Lobster pot strings of three or less pots need only be marked with a single buoy. The amendment also establishes a maximum continuous length of 1-1/2 miles for any string of lobster pots.

These marking and setting requirements were selected through lengthy consultation with industry representatives. The gear marking system proposed (a single shape on the east end and a double shape on the the west end) conforms to international standards and is the most widely accepted by the industry.

* Guidelines for improved gill net marking are now part of a voluntary effort to resolve conflicts between gill net fishermen and party/charter boat operators competing for productive fishing grounds in the Gulf of Maine. Gill netters are encouraged to mark the name of their vessel on tide balls and to use standard markings on western and eastern ends of gill net sets to allow other users to anticipate the direction of set.

Minimum spacing requirements have also been discussed as a possible measure to alleviate conflicts between these user groups. Minimum spacing requirements would lessen preemption of bottom by gill nets by allowing other users to fish between them, while still allowing for the use of gill nets in high conflict areas. Many gill netters contend that these requirements would only serve to allow gill netters not complying with the rules to set between other nets already set.

* Resource managers in New Hampshire have recently implemented regulations which establish minimum gear marking requirements for gill nets fishing in state waters. They are hopeful that by improving the visibility of gill nets, these regulations will result in fewer conflicts among gill netters and party boat operators.

* In Maryland, an existing regulation states that a person may not set or fish a trotline or collapsible crab trap within 50 ft. of a trotline. This regulation was implemented to reduce conflicts between sport crabbers setting trotlines and collapsible crab traps too close to commercial trotlines. Fewer complaints by commercial trotline operators indicate that this regulation is working.

* Designated buoy-free channels have been established in Maryland to reduce conflicts between blue crab pot fishermen and recreational boat traffic. These buoy-free channels run between lighted navigational aids so that they can be easily followed; the locations of the channels are routinely published in Maryland's "Cruising Guide." Crab potters have cooperated in keeping these designated channels free of buoys, and complaints from boaters have subsided.

* Because of spatial conflicts between fixed and mobile gear fishermen in North Carolina, setting and marking requirements have been instituted for the placement of pound nets. Pound nets must be pulled, if not being used, must be "marked for night vision" and must have openings in the leads to facilitate navigation. Compliants from mobile gear fishermen have declined substantially since these regulations have been in place.

* Standard state-wide marking procedures for leased aquacultural areas are being proposed in California as a measure to reduce gear conflicts between aquaculture lessees and navigational and fishing activities. No gear conflicts have occurred to date in areas where these marking standards are being tested.

3.2.2 Gear Reporting and Notification Systems

The implementation of special arrangements for notifying mobile gear operators of the location of fixed gear, or for notifying fixed gear fishermen that mobile gear fishermen or commercial vessels will be operating in an area, can be a useful mechanism for preventing conflicts.

* To prevent conflicts between domestic fixed gear fishermen and foreign mobile gear fishermen operating in the FCZ, the Coast Guard operates a program whereby U.S. fishermen may report the location of their fixed gear; the locations are then broadcast by the Coast Guard. Reporting fixed gear within foreign fishing windows is voluntary for U.S. fishermen and it is mandatory for foreign trawlers to remain outside of broadcast fixed gear areas.

* As a result of conflicts along the California coast between seismic survey vessels, permit and notification systems were established by governmental agencies based on input from fishermen and oil industry representatives. The permit system set guidelines for seismic companies, and the notification system was intended to inform fishermen of the times and locations of seismic activities. The notification system has been less successful than anticipated. Fishermen complain that they are not given sufficient warning of seismic survey activities while the companies conducting such surveys claim that fishermen are difficult to contact and often ignore survey notices (Kronman 1983).

* Fall commercial shrimp trawling activities in Georgia's Sounds has often led to conflicts with commercial crabbers who deploy fixed gear in these waters throughout the year. In response to the conflict, marine resource managers have given commercial crab fishermen several days notice that the Sounds will be open to shrimp trawling. This arrangement was most successful in 1985 when crabbers were given five days notice to relocate their traps.

3.2.3 Area/Season Closures

Restrictions on the use of a particular gear in a particular area during designated time periods is the management measure most often adopted to resolve conflicts between incompatible gear types. To minimize impacts on affected user groups, such regulations should apply only in areas and during times that conflicts occur. The effects of these regulations should be continually monitored and adjusted in response to changing information or practices.

* Conflicts similar to those encountered in the Northeast occur between party boat operators and commercial gill netters in central California. Legislation aimed at resolving the conflict placed limits on net length, established a moratorium on new gill net permits and established area restrictions for gill nets. The party boat fishery has since expanded out of these areas and is pressing for further restrictions on the use of gill nets.

* The State of Maine has implemented a number of areas where scalloping can and cannot take place during November and December, the season of greatest conflict between scallop draggers and lobstermen. Although the arrangement has been moderately successful, scallopers complain that they have borne the full burden of resolving the conflict. There is now a petition being circulated by Maine lobstermen which calls for an annual nine month closure on scallop dragging in a nine-mile strip of federal water.

* Conflicts between commercial gill net fishermen and sport fishermen for productive shad fishing grounds around the Chesapeake Bay Bridge led to legislation prohibiting the use of gill nets within 1,200 ft of the bridge during shad season. This legislation has been successful, in part, because it has been relatively easy to enforce. However, it has also resulted in a loss of fishing opportunity (albeit a small one) for the few gill net fishermen affected.

3.2.4 Gear Separation Strategies

Physical separation of gear types through temporary designation of gear zones is a conflict resolution scheme which is gaining interest among resource managers. Unlike area/season restrictions, gear separation strategies place restrictions on more than one gear type. Boundaries separating gear types are usually defined by LORAN coordinates.

Gear separation strategies depend a great deal on communication and compromise between conflicting users. Without such compromise, or a willingness to cooperate, this approach is relatively useless. Experiences with this technique in Connecticut have shown a high degree of support in some areas and a total lack of support in others, reflecting differing local attitudes towards the nature of the conflict and potential possibilities for resolution.

* The temporary statute enacted in 1983 which restricted trawlers operating in Connecticut waters of western Long Island Sound to a possession limit of 100 lobsters, prompted many trawlers to concentrate their directed fishing efforts for lobsters east of the designated line, consequently displacing much of the conflict to a more eastern area.

After an initial (and bitter) conflict, pot and trawl fishermen from this area have been successful in overcoming much of the problem through voluntarily establishing trawl lanes which are to be kept free of pot gear. This negotiated compromise -- although not perfect -- has generally been well received by both groups and has greatly decreased the incidence of gear conflict in those areas affected by the arrangement.

* Competition for coexisting resources between oyster fishermen and soft clam fishermen led to legislated gear separation in Maryland. This arrangement has been successful in areas that are easily enforced, however illegal clamming still exists in some remote areas.

* When exploring options for the resolution of conflicts between mackerel fishermen in the South Atlantic (sec. 3.2.1), management measures were considered that would separate competing commercial gear types by water depth. Specifically, in high conflict areas and during peak seasons (April 1 - April 15), commercial net boats would be prohibited from fishing for king mackerel in depths between 60 and 110 ft., while commercial hook and line boats would be prohibited from fishing in depths less than 50 ft. This measure was rejected because there would be overlapping zones in which fishing can take place by both gear types, and the time period proposed for the separation was not be long enough to allow for annual and seasonal differences in king mackerel availability. Because of these factors, enforcement would be difficult, conflicts might still occur, and efficiency of both gear types would be inhibited (Gulf of Mexico and South Atlantic Fishery Management Councils 1985).

* A primary objective of the "Fishery Management Plan for the Stone Crab Fishery of the Gulf of Mexico" developed by the Gulf of Mexico Fishery Management Council was the resolution of severe and often violent territorial conflicts between stone crab fishermen (using stationary traps) and shrimp trawlers in the Gulf of Mexico. The conflict arose when stone crab fishermen expanded their activities into deeper waters at the same time shrimpers moved into areas traditionally prohibited to shrimp trawling. As a result, there was significant loss and destruction of stone crab traps to trawling activities.

The plan, by establishing a "line of separation" during the period when the seasons overlapped and conflicts were most likely to occur, employed area/seasonal separation as the principal management tool to resolve the conflict. It is maintained that in addition to reducing the risk of gear conflict, these regulations will result in biological benefit to the shrimp stocks by postponing their harvest in the area closed to shrimp trawling.

While the plan recognized that the use of closed areas would have adverse impacts on certain segments of both industries, the final regulation was developed through compromise agreement between industry representatives and was thought to have the least adverse impact on either group. Most public comment indicated support for the regulation as the only viable solution to the conflict. A specific monitoring consideration included in the plan called for yearly evaluation of the line for it's "effectiveness, fairness, and impact on the two industries".

To aid in compliance with the regulation, provisions were made to distribute a description of the line including LORAN coordinates to participating user groups. According to the Executive Director of the Gulf of Mexico Fishery Management Council, this plan has been extremely successful in resolving the conflict, due in part to efficient enforcement.

3.2.5 Time of Day Restrictions

Conflicts betweeen incompatible gear types competing for productive fishing grounds or valuable species are sometimes resolved through establishing restrictions on the use of a particular gear type during times that conflicts are most likely to occur.

Because Connecticut gear conflicts were often a consequence of the inability of trawl fishermen to see fixed gear buoys at night, the DEP recommended in 1985 that summer and fall night trawling closures be implemented in areas where gear conflicts had occurred. Since relatively little pot gear is set from January to April, and gear conflict was minimal during these months, it was proposed that these regulations only apply from May 1 - December 31. This proposal met with considerable opposition from pot fishermen concerned with potential pot losses and, consequently, it was not approved.

* Other New England states faced with similar conflicts between fixed and mobile gear have also enacted night trawling prohibitions. Night dragging closures were instituted in 1985 by the Commonwealth of Massachusetts in areas of high fixed gear concentration. This measure were later rescinded because it was difficult to enforce and because it posed financial hardship on trawl fishermen. Regulations have also been adopted in Maine which prohibit night scallop dragging in Maine's territorial waters.

* Daytime closures have been instituted by the California Department of Fish and Game as a management tool to reduce conflicts between commercial drift gill net fishermen (which inflict incidental mortality on marlin -- a designated recreational species) and recreational fishermen. Although these daytime closures have lessened visibility between drift gill netters and recreational fishermen, they have been not been successful in allaying fears that gill netters are catching large numbers of marlin, and recreational fishermen are lobbying for season/area closures as well.

3.2.6 Technological Solutions to Conflicts over Space

The development of compatible gear types and improved navigational equipment can be of assistance in the resolution of fixed vs. mobile gear conflicts. For example in the early 1970's permit applications by the State of Georgia, for construction of nearshore artificial reefs were withdrawn in response to comments by commercial shrimp trawlers that such structures and debris associated with them, would result in significant gear loss and preemption of fishing grounds. These concerns were compounded by the lack of accurate positioning systems and because buoys placed on similar nearshore wrecks were ineffective. As a result, the state's offshore reefs were constructed outside of nearshore trawling grounds. Because of advances in navigational equipment such as LORAN C, improvements in buoying techniques, and advances in artificial reef technology, the state is once again considering the placement of nearshore artificial reefs. To facilitate this process, the program intends to solicit input from concerned user groups, prior to the permitting process.

3.2.7 Territorial Use Rights

"Territorial behavior" among users of fixed gear competing for space on productive fishing grounds may sometimes result in conflict avoidance but such behavior can also result in acrimonious, if not violent, confrontations. Often fishermen, especially those employing fixed gear, enjoy exclusive rights to an area established either through long-standing traditions or through leasing of the seabed for aquacultural activities. As one would expect, fishermen who enjoy such relatively exclusive rights tend to get involved in less conflicts related to resource use than do those who do not enjoy such rights (Miles 1984). However, getting to the point at which one "holds" such "rights" can be a volatile experience.

* Shad are harvested exclusively by drift gill nets in the Connecticut River, with the fishery being concentrated at the mouth of the river. Through long-standing traditions, desirable fishing grounds areas are sometimes "claimed" by one or more groups of fishermen. Shad fishermen usually agree amongst themselves on a time schedule or "order of rotation" in setting their nets to minimize conflicts.

* Competition for productive grounds among pound net fishermen and components of the gill net fishery in the Chesapeake Bay led to the enactment of local laws, some dating back to the late 1800's. Many of these laws have been in place for so long that fishermen have established "territorial rights" to areas. According to a resource manager in Maryland, "the tangle of laws is sometimes hard to interpret and is not effective in responsive resource management but has suited the social requirements of the fishing community."

4.0 ALTERNATE DISPUTE RESOLUTION TECHNIQUES

4.1 Introduction

The preceding discussions have concentrated on management options for the resolution of user group conflicts. The success of these management measures depends a great deal on how well they are accepted by the user groups that will be affected by them. The most successful solutions to conflicts appear to be those which involve negotiation and compromise among competing user groups.

In fisheries management, disputes are usually handled by legislative, administrative or judicial procedures. Often, regulations are drafted by resource managers with little or no industry input or legislation is proposed by an adversary before any communication has taken place between conflicting parties. In a judicial suit, the plaintiff states how he has been wronged by the defendant, and the defendant responds to these charges. With such proposal and reaction, the stage is set for contentious outcomes (Rehfus 1985). Antagonism between competing user groups is nurtured, closing down lines of communication. Those dissatisfied with the outcome may attempt to change it using whatever resources are available. In environmental disputes, the parties have many such opportunities through administrative appeals, litigation, and political action (Bingham 1986).

Given the limitations of traditional means of handling disputes, resource managers are exploring new techniques to replace or supplement traditional methods of conflict resolution. Many of the management measures that have been discussed were the result of negotiation and compromise between resource managers and user group representatives. While there are differences among the approaches, all are voluntary processes that involve some form of consensus-building, joint problem solving, or negotiation (Bingham 1986) and are based on the premise that those directly involved in a dispute are best qualified to identify and analyze the problem and develop a workable and equitable solution.

Dispute resolution techniques do not attempt to resolve the fundamental differences that separate the parties in conflict but can help parties agree on how to accommodate their competitors and to co-exist despite their continued differences (McCormick 1982). Therefore, cooperation and compromise are essential elements of successful dispute resolution. Each group must recognize the "give and take" nature of negotiation and decide what forms of resolution are acceptable to them.

There are several reasons for considering the use of alternate dispute resolution in fisheries management. Often, conflicts are more a matter of perception than reality and improved communication between user groups may help in alleviating or avoiding conflicts based on misunderstanding. Because enforcement capabilities are limited, the success of a management measure

often depends on voluntary compliance and competitors are more likely to support and comply with rules with which they agree and have helped to establish. Finally, productive negotiations will improve understanding and relations between competing user groups, opening up lines of communication and facilitating resolution of future conflicts.

The choice of dispute resolution techniques depends on the duration of the conflict and how well it is established, the relationship of the disputing parties, the resources available (time and money) to deal with the conflict, and how well motivated the parties are to reach an agreement (Cox 1984). The alternate dispute resolution techniques which we feel are most applicable to fishery related conflicts will be discussed.

4.2 Negotiation

Negotiation is a decision making process whereby conflicting parties deal directly with one another to identify their problems and work out a compromise to their differences. If an agreement is reached, the parties may choose to enter into a contract which may or may not be binding. Good faith negotiation implies that the parties involved in a dispute have the authority to implement their agreements (Rehfus 1985). Regulatory negotiation involves bringing affected parties together to identify the issues and to assist fishery managers and legislators with the formulation of draft regulations pertaining to these issues.

Resource managers can encourage the negotiation process by encouraging competing user groups to resolve their own differences and by establishing forums where industry representatives can meet with each other and with resource managers to discuss and work out solutions to their problems and assist in the development of regulations. Such forums have already been used extensively as a fisheries management tool and take the form of advisory panels, advisory committees, and working groups. Proposals drafted by these groups can then be sent to other members of the industry or taken to hearing for additional comments.

4.3 Joint Problem Solving

Resource managers often address user group conflicts on a "crisis basis." Ideally, the implications of new developments, and expansion or changes in practices of user groups should be examined before a conflict has fully evolved. Joint problem solving is a planning process, whereby an agreed upon panel of representatives are selected to identify and analyze their problems and discuss possible solutions. As with other alternate dispute resolution techniques, joint problem solving is aimed at achieving a group consensus, and is most useful after a conflict has emerged, but before positions have been polarized (Nyart 1984). A neutral third party or "facilitator" may be introduced to the joint problem solving process to design and conduct meetings and to assist participants in reaching a mutually agreeable decision (Rehfus 1985).

4.4 Mediation

Mediation is negotiation with a neutral third party present to assist in reaching a settlement, and is most applicable when conflicts are fully developed and initial attempts at negotiation have failed. While negotiations can and do occur without a mediator, mediation always involves negotiation.

A number of criteria are implicit in the mediation process: The involvement of the parties in the mediation process and their acceptance of the mediator is voluntary; the parties jointly explore and debate the issues, both in joint sessions and in meetings of one or more of the parties with the mediator; the mediator has no authority to impose a decision; the mediator facilitates the negotiation process by assisting the parties to reach a mutually acceptable settlement which is arrived at by consensus rather than majority decision; and the mediator shares the responsibility of ensuring that any agreement reached represents a technically, financially and politically viable solution (Cormick 1982).

While the cost of retaining a professional mediator may seem prohibitive, the economic consequences associated with maintaining a conflict must also be considered. These costs include gear damage, loss of catch and lost fishing time. There is an increasing trend to train resource managers in both the vocabulary and techniques with respect to conflict management processes. Conflict management training is currently gaining popularity within the federal government (Cox 1984).

4.5 Arbitration

Arbitration is the most rigid of the dispute resolution techniques that will be discussed and is sometimes used when less formal methods fail. Unlike litigation, arbitration is a voluntary process and the parties involved in the conflict may choose the decision maker (arbitrator). Individual arbitrators may be chosen or an organization can be brought in to provide arbitrators which specialize in particular types of disputes. Unlike litigation where the judge's decision is binding, the decision of the arbitrator may or may not be binding, depending on the advance agreement of the parties (Nyart 1984).

4.6 Mini-Trials

The mini or "mock" trial is a dispute resolution technique that combines elements of negotiation, mediation and adjudication. They are best known for their application in business disputes but can be adapted to disputes involving resource allocation (Green 1984). The major innovation of the mini-trial is that it removes the decision making process from the hands of third-party judges, and places it in the hands of representatives from disputing parties (Nyart 1984).

Although procedures may vary, mini-trials contain several common elements: 1) participation is voluntary, 2) procedural agreements are established before the trial, 3) prior to the trial, parties informally exchange information and key documents, 4) in most mini trials, a "neutral advisor" (often a former judge) is mutually selected by the disputing parties (although allowed to ask questions and rule on the admissibility of evidence, the "judge" has no authority to implement a decision), and 5) settlement authority is granted to non-legal representatives who have been chosen by the disputing parties. These representatives are often managers of the contesting companies or, in some way, have been a party to the dispute (Green 1984, Nyart 1984). After hearing testimony by lawyers representing the opposing parties, the representatives meet privately to negotiate a settlement. If unable to reach a decision, non-legal representatives may ask for the advice of the Neutral Advisor or may schedule further negotiations. Their final decision may be binding or non-binding, again depending on the advance agreement of those involved.

Mini-trials provide disputing parties an opportunity to exchange views and the process gives them a more realistic appraisal of how their arguments will be perceived in court. Because they serve to educate opposing parties and enable them to "refocus on the merits of the dispute", mini-trials have been successful in cases where communications have broken down and compromise through traditional negotiations did not appear possible (Green 1984). After participating in a mini-trial, disputing parties are often motivated to negotiate a settlement by their desire to avoid litigation.

5.0 THE OUTCOME OF DISPUTE RESOLUTION -- VOLUNTARY AGREEMENTS VS. REGULATION VS. LEGISLATION

The nature of user conflicts is dynamic -- constantly changing with changing practices among user groups and fluctuations in resource abundance. There are no simple solutions to user group conflicts and any management measures proposed to must be flexible enough to respond to these changes.

Voluntary or "gentlemen's agreements" established by competing user groups are most adaptable to changes in the fishery, and negotiations are often most successful when conflicting parties have the authority to make and implement their decisions. However, a significant drawback of voluntary, informal agreements is non-compliance due to the absence of enforcement. These agreements, therefore, often act to the disadvantage of those who comply and the benefit of those who don't. Voluntary agreements are also limited by the introduction of "outside" vessels or newcomers, unfamiliar with the area and established practices of local fishermen. Often when voluntary agreements fail, more restrictive measures are eventually proposed by those dissatisfied with the outcome.

Typically, regulations and laws governing the use of fishery resources have been specified by statute and require legislative action for change. Given the cumbersome nature of the legislative process, we believe that use conflicts are better resolved by the competitors themselves, or by administrative (regulatory) process when some formalization proves necessary.

At the beginning of the Connecticut controversy over the taking of lobsters by trawlers, the species was the only living natural resource within the DEP's area of jurisdiction not managed by regulation. In response to the DEP's recommendations, Public Act 85-434, passed during the 1985 legislative session of the Connecticut General Assembly, granted regulatory authority for purposes of lobster conservation and management to the DEP. This action will allow for an efficient and flexible means to test and revise management measures in response to changes or new information concerning the resource or fishery practices. Moreover, it will ensure appropriate legislative oversight through the General Assembly's Regulations Review Committee and adequate public input through public meetings and hearings (Smith et al. 1985).

Resolution of the gear conflict element of the Connecticut controversy has involved the formalization of fishermen-negotiated agreements governing the use of fixed and mobile gear in so-called "gear separation zones." Importantly, this mechanism has been proposed for an area of the state in which such agreements have already been shown to be successful on a voluntary basis. The "formalization" referred to institutionalizes the process so that legal notification of gear areas can be accomplished and the actions of recalcitrant fishermen penalized. In other areas, in which competitors remain in adamant opposition to one another, the measure has been excluded from consideration.

6.0 EXAMPLES OF DISPUTE RESOLUTION TECHNIQUES IN FISHERY RELATED CONFLICTS.

* A compromise "line of separation" was the primary management measure used to resolve territorial conflicts between Florida stone crab fishermen and shrimp trawlers (sec. 3.2.4). While the plan recognized that the use of closed areas would result in unavoidable adverse impacts on certain segments of both industries, the final regulations were developed through a series of negotiations between representatives of the stone crab and shrimping industry in an attempt to resolve the conflict as equitably as possible. Provisions were made to "maintain close liaison with the members of the Stone Crab Subpanel and Shrimp Subpanel of the Gulf Council's Fishery Advisory Panel and to hold public hearings at the close of each fishing season to continually monitor existing management measures for their effectiveness, fairness and impact on the two industries." To date, this line of separation has been very effective in resolving the conflict.

* In the Northeast, a conflict between gill net fishermen and charter/party boat operators is one of the major problems confronting the New England Fishery Management Council. The conflict arises from intense competition for similar species on limited productive fishing grounds.

Recognizing that a major cause of the conflict is the lack of understanding and working relationships between user groups, the Council's Gear Conflict Committee has stressed the need for communication and compromise and, through the use of advisory panels, has provided a forum for industry representatives to meet and discuss their problems.

Despite their commitment to achieving a voluntary, non-regulatory solution to the problem, the Council's efforts to foster communication and compromise have met with little success. Currently, at the Council's suggestion, a professional mediator is meeting with the groups in an attempt to facilitate a compromise.

* The incidental capture and mortality of marine mammals and valued recreational species in pelagic drift gill nets, has been the subject of intense conflict between commercial gill net fishermen, recreational anglers and conservation groups in California. The California Department of Fish and Game initiated a fact finding program to help define and resolve conflicts between commercial gill netters and conservation interests concerned over the entanglement of diving birds and marine mammals in such nets. Although controversy remains, the situation is expected to improve as new information becomes available, regulations change, and political pressures recede. The Department has also held training sessions to explain current regulations to inexperienced or non-English speaking fishermen.

* The discovery of vast sulfide deposits off the coast of Oregon and California initiated a federal proposal to lease broad areas

for exploration of mineral resources. This proposal led to concern and conflict among government officials, the fishing industry and offshore mining interests.

It has since been recognized that many of these conflicts could have been avoided through early involvement of concerned parties in the initial planning process. As a result, a joint working group has been established to involve technical experts and state and federal officials and to provide an opportunity to assist in the preparation of environmental reviews and policy discussions. This working group, which was designed to facilitate communications and reduce the possibility of conflicts between Federal agencies, state government, industry representatives and the public, has been instrumental in achieving state and federal agreement on several key issues (Hull 1984).

CONCLUSIONS

Marine fishery resources are the last of the nation's "wild" animal resources that are subject to commercial as well as recreational exploitation. Conflicts over marine resource use between these two groups are divisive, in large part, because they place users with entirely opposite philosophies (profit vs. sport) in direct competition for the same limited resource. Conflicts between different groups of commercial fishermen are equally divisive because the profit motive stimulates the competition, and this is a very strong incentive. In general, use controversies seem to be inspired by the fear of each group that the activities of the other will exclude their own. This common element -- the fear of being excluded -- seems to motivate all competitive conflicts over marine resource use.

It is quite common that controversies over use have as their proponents those who claim conservation as their sole motivation. This has occurred throughout time (Alexander 1915, Smith et. al. 1985) and is likely to continue to occur into the future. However, when the emotion subsides, one finds almost inevitably that the true motivation of many of the antagonists was competition, either for money or for opportunity to take the resource.

The most successful solutions to user conflicts appear to be those in which the "governing process" is delayed and the antagonists are required to negotiate a solution. Consequently, communication or "cooling off periods" and the ability to avoid confrontation seem to be critical ingredients to acceptable solutions. In the absence of negotiated, compromise solutions, the active methods of resolution which seem to have achieved the most success are gear separation areas (i.e. keep the combatants apart) and "regulated inefficiency" (i.e. limit the efficiency of the party perceived to be too efficient). A third method, not often attempted for obvious reasons, is to reduce the number of competitors by whatever means deemed acceptable. It may be that this method, however undesirable it may appear to be, will become the ultimate solution to such conflicts. This will depend on both the ability of managers and the willingness of competitors to recognize and respect the rights and opportunities of a variety of users to share the common resource.

A common element of virtually all marine resource use controversies is that commercial fishermen are involved as one or both of the competing groups. Extending the logic of this statement suggests that elimination of commercial fishermen will eliminate most use controversies. An important question for marine resource managers, therefore, is "why, as resource managers, should we bother to support commercial fisheries if they are the cause of such controversies?"

The largest group of marine resource users in this nation is the one constituted by the non-fishing consumer of seafood. While these constituents may be totally unorganized, relatively uninfluential, and usually unaware that a use controversy exists, this does not diminish the importance of nonfishing seafood consumers as the nation's largest group of marine resource users. Moreover, since it is commercial fishermen who produce seafood for the consumption of the non-fishing public, this justifies their existence -- under constraints dictated by at least two resource conservation and management principles: first, that protection of the resource is ensured so that it can sustain itself and, second, that the surplus yield from that properly managed resource is equitably allocated for the greatest good of society.

In this regard, we suggest that the food-producing capacity of a properly-managed and conserved marine resource is of far greater benefit to the health and well-being of our society than any of the more economically-oriented arguments usually presented by sport and commercial fishing groups when defending their particular industry. The progressive exclusion of commercial fishing for marine resources is a trend which must be discouraged if the non-fishing consumer of seafood is to retain his or her opportunity to share in the resource. It is for this reason that support of properly managed commercial fisheries should receive emphasis in marine resource programs.

Nothing in these statements is intended to diminish the traditional importance of sport and commercial fisheries in their own right -- in fact, both are important for a variety of reasons. Rather, the statements are intended to provide a perspective which is sometimes lacking in discussions regarding resource use.

Even as support for commercial fisheries is encouraged, we recognize that profit motives will continue to result in conflicts between opposing groups of commercial users. Resource managers will be challenged to conserve resources and encourage conflict resolution while trying not to interfere in the motivation -- competition for dollars.

Many -- not all, but many -- commercial fishermen do not look beyond the value of the day's catch in deciding whether or not the fishery is productive. This is a major difference between commercial and recreational fishing philosophies and, for this reason, commercial fishing regulations must be strictly enforced -- with penalties that truly deter violation of the law. There must be a strong economic disincentive for violating laws and regulations established for conservation purposes. We stress conservation purposes because there have been an increasing number of socio-politically inspired management measures enacted during the last decade under the guise of conservation but intended to eliminate competing user groups. Ideally, such measures should be rescinded; practically speaking, they probably never will. At the minimum, the economic disincentive for violating such measures should not be as stringent as that intended to deter violations of conservation law.

Given the desirability of maintaining opportunities for marine resource use for consumers, sportfishermen, and commercial fishermen, the type of controversies discussed in this report are likely to continue. Resource managers will have to educate and arbitrate in a more effective way than ever before, or suffer through increasingly antagonistic and competitive conflicts over resource use.

The consequences of controversies over resource use are numerous -- polarization of groups which could be allies in efforts to rectify common problems (e.g. pollution abatement), dissipation of resource management agency efforts which might more productively be devoted to other issues, and potentially, elimination of the opportunity of one or another group of users to use marine resources. Since such conflicts are not likely to "go away" and since all present uses have their benefits, we believe our efforts must now be devoted to development of more successful methods of conflict resolution.

RECOMMENDATIONS

1) **AVOID CONFRONTATIONS** by anticipating conflicts and encouraging early and direct communication among competing user groups. Ideally, the implications of new technology or changing practices among user groups should be examined before a conflict has evolved. Fish Aggregation Devices (FAD's) and artifical reefs are examples of recent development with high potential for conflicts over their use. Many of these conflicts can be avoided through early consultation with interested parties and establishing ground rules prior to their implementation.

2) **DEVELOP A RESOURCE EDUCATION CAPABILITY** dedicated to informing the public of the nature of fishing gears or fishery uses which may be either unknown or just poorly understood.

Resource education - the development of an informed public - has a number of advantages, not the least of which is the resolution of use controversies which result from misinformation. In addition, the development of a conservation ethic in a public increasingly making use of marine resources can be a significant contribution to resource management efforts.

3) **CONSIDER THE USE OF ALTERNATE DISPUTE RESOLUTION TECHNIQUES** to augment legislative or regulatory processes. Create a working group or "arbitration board" through which all competitive controversies must pass before the legislative or regulatory processes can be initiated. Members should include legislators or agency representatives (depending on which method of government is used in resource management, and representatives from competing groups.)

The premise behind this recommendation is that, in a competitive controversy, conservation is generally not the real issue but it is often claimed to be the real issue. As a result, providing a "cooling off period" for discussion between the combatants will not have an adverse impact on the resource but it may allow for conflict resolution without legislative or regulatory action. At a minimum, it will allow legislators, resource managers, and competitors to explore the real issues without the pressure of having to respond immediately to what may not be a real problem.

Simply knowing that competitors have to discuss the problem with one another before legislation or regulation can be initiated will result in communication and, usually (but not always), in resolution of the problem. Importantly, "induced communication" prior to legislative or administrative processes will open lines of communication between competitors and may result in an early solution to the conflict.

Competing user groups are more likely to support and comply with rules and regulations they help to establish. However, a deadline for the completion of such proceedings should be specified so that continued, but unsuccessful communication will not obstruct other methods of conflict resolution.

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